### Introduction

<!-- \_Introduce your research topic (the problem) and briefly review related work. -->

Social media has become a major means of communication, expression of opinion, and publishing and promoting thoughts, ideas, facts and of course a lot of falsehood as well. Although there are myriad good uses of social media that benefit the greater good of humanity, there are also many instances where this means of communication has been abused by publishing provoking thoughts and beliefs that lead to hatred, polarity, and division.

Hate speech and harassment on social media has rippling damaging effects on the society (Blackwell Lindsay, 2017). Studies have been conducted to track such activities by leveraging natural language processing techniques and tools to classify online comments or tweets into different categories. In their research, (Suvadip Paul, 2018) classified tweets as racist or sexist or neither.

<!-- \_Be sure to answer these two questions: (1) Why does this topic matter and (2) What is the background knowledge that someone would need to understand the field or area that you have decided to investigate? -->

While most people around the world use social media, politician are no exception. In fact, in many cases they take the full advantage of social media to spread their influence on the masses and obtain competitive advantage over the competition. A very recent example is the former president of the United States, Donald Trump. Trump's active presence on twitter led to myriad of controversies during his service in the Oval Office. Lot of research is being conducted to analyze Trump's tweets from different angles. (Xin Pei, 2020) inspired by Donald Trump's tweet referring to Corona Virus as Chinese Virus, attempted to understand the negative sentiment reflected in tweets with racist hashtags across the development of COVID-19. They analyzed tweets with racist hashtags that carried a negative sentiment to probe the impact of the global pandemic on the topic.

Our work is simple to understand and relies on Word2Vec, a neural network which learns word associations from a vocabulary to help detect and suggest synonyms, closely related words, and others. Though the jargon could be intimidating but the methodology requires a basic understanding.

\_In this section, you should include sources that help explain the background area and cite them in APA style. 5-10 articles across the paper would be appropriate - be sure to include these! They are part of the grade! This section should be 3-5 paragraphs.

Understanding the hate speech and bullying on online (Blackwell Lindsay, 2017) and its effects (Koustuv Saha, 2019) on different classes of society. Curbing hate speech and vitriol on online platforms is very much essential and with ongoing pandemic, lot of people are reaching out to social media.

Big Tech companies are also feeling the pinch in their stock prices (Goldman, 2018) whenever there is an event of mass shooting, etc., Lot of research is being devoted to detecting and curb hate, racism, and fake news on social media. Rise of extreme right-wing communities on social platforms like 4chan, Reddit, Facebook, Twitter, and others is witnessed. Memes and other popular methods made deep reach and strong influence (Lamerichs, 2018).

Trump is major source of misinformation and a large driver to push it into masses, social and mainstream media (Sarah Evanega, 2020). Inspired by the previous studies and new methods utilizing machine learning and NLP techniques to analyze Donald Trump's tweets in promotion of hate, racism, and division among American people (Gaydhani, 2018) and understanding the sentiment of his tweets (YAQUB, 2020).

### Research Question

\_Define what the problem is and what the goal of the analysis is. Then, specify at least one research question that you answer with your analysis. This section should be a full paragraph.

It is certain that the president of the United States' statements whether in the news or on social media have a great influence on American people along with people around the world. There have been debates whether the U.S. president Donald Trump's tweets provoked racism, hatred, and division among American people. This research aims to analyze Trump's tweets to bring light to this issue.

### Method

Explain the data you have selected to study. You can find data through many available corpora or other datasets online (ask for help here for sure!). How was the data collected? Who/what is in the data? Identify what the variables are for the analysis. How do these variables fit into your research question?

After suspension of Trump from Twitter, finding his tweets was a problem but thankfully due to efforts from (Brendan) we have an [archive](https://drive.google.com/file/d/1xRKHaP-QwACMydlDnyFPEaFdtskJuBa6/view?usp=sharing) of his full tweets. The dataset is a raw twitter archive with simple and essential fields - Tweet ID#, Tweet text, Retweet Flag, Deleted Flag, Device, Favorites, Retweets, Date, Flagged Flag. All the columns are simple and self-explanatory, doesn’t require much explanation of data fields.

**Graphical user interface, text

Description automatically generated**

For our analysis, only few columns are used – id, text, and data. These columns are loaded to another data-frame and used in further work. More fields are further processed and derived from text field and added to the data-frame – tweet (cleaned text), hashtags (hashtags in texts), token\_tweet (tokenized words from tweet column) and tweet\_class (tweets classified as racism/hatred/divisive/none).

Graphical user interface, text, application

Description automatically generated

Tokenized words from tweets help us build a vocabulary of words used or retweeted by Trump. These words are essential for classification of tweets. Hashtags though aren’t used in the actual classification process but helped us validate the classification if there was any.

Describe how you are analyzing the data and why. Here you basically want to justify how your analytic plan will answer your research question. Length of this section will vary, but you should describe your data and analytic plan well enough that someone without a strong background in analytics could understand it.

We have tried to create a tagger or classification strategy and used it to tag all the tweets from Donald Trump into four category which are Divisive, Hatred, Racism and None (Neutral). Tweet classification helps to successfully answer the research question and was necessary to see the trend and variation in the volume of the tweets which directly or indirectly belong to one of the above-mentioned categories.

After pre-processing the data, cleansed from links, URLs, emojis, mentions, hashtags, special characters, and stop words, we tokenized each tweet and store them in a separate column, token\_tweet, in data-frame. A word vocabulary from all the tokenized words was built, these words are fed to Word2Vec model, a neural network for word embedding. The vocabulary is built using words which at least appear 10 times or more in his tweets.

We later bagged all the words using word2vec model digging into the whole vocabulary finding most similar words with a threshold set to 90%. Three set of bags are created with most similar words to ‘racist’, ‘hatred’ and ‘division’.

A simple function was developed to classify the tweets, which is based on checking the percentage of how many tokenized words of the tweet appear in each three bags of words. A tweet is classified as None, Racist, Hatred or Divisive if the words appear 60% or more from the respective bag. A plot of classified tweets across timeline can help us analyze, understand and reason based on prevailing circumstances.

### Analysis

Analyze the data given your statistical plan. Report the appropriate statistics for that analysis (see lecture notes). Include figures! Include the R-chunks so we can see the analyses you ran and output from the study. Note what you are doing in each step. Length of this section will vary, but you should describe your results well enough that someone without a strong background in analytics could understand it.

Refer to the code and graph from the report, which we have used to make our inferences from.

### Discussion

Summarize the results from your study in as plain of language as possible. How does this relate to previous literature? What have we learned from you doing this analysis/study?

Based upon the year and month over month trend of the overall frequency of tweets has gone up but the post elections 2016 there is a significant and consistent increase in divisive and hatred tweets. Also, an interesting fact that the number of divisive and hatred tweets are more in the 4th quarter of the year.

Describe the implications of your study and what the practical applications of the findings might be. Here you want to consider what actions might your readers (or company) take based on your conclusions.

Based upon our analysis and study, it can be clearly seen that how the tweets from former President Donald Trump were majority of negative sentiments with provoking statements which has only spread hatred and conflict in the country.

### Credit Guidelines

If working in a group, specify what each member of the group did. For each of the steps below, specify who did the work. If more than one member worked on the step, put names of everyone who worked on it.

- Developed Research Question, Umit Vatandost

- Acquired Data - Ravi Tanikella

- Analyzed Data - Ravi Tanikella, Tarun Dey

- Researched Related Work - Umit Vatandost

- Wrote Introduction - Ravi Tanikella, Umit Vatandost

- Wrote Method - Ravi Tanikella, Tarun Dey

- Wrote Analysis/Results - Ravi Tanikella, Tarun Dey

- Wrote Discussion - Ravi Tanikella, Tarun Dey

- Revisions/Edits - Ravi Tanikella, Tarun Dey, Umit Vatandost

### References

Include your references in APA style.

Blackwell Lindsay, D. J. (2017). Classification and Its Consequences for Online Harassment: Design Insights from HeartMob. *ACM Journals*, Article No.: 24.

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YAQUB, U. (2020, November). Tweeting During the Covid-19 Pandemic: Sentiment Analysis of Twitter Messages by President Trump . *Digital Government: Research and Practice, Vol. 2*, pp. No. 1, Article 1.

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